U.S. ENVIRONMENTAL PROTECTION AGENCY
UNDERGROUND INJECTION CONTROL PERMIT
CLASS I COMMERCIAL NONHAZARDOUS
PERMIT NUMBER MI-055-1I-C001
Team Completions, LLC
Kalkaska, Michigan

TABLE OF CONTENTS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF:
WU-16J

U.S. ENVIRONMENTAL PROTECTION AGENCY UNDERGROUND INJECTION CONTROL PERMIT: CLASS I COMMERCIAL NON-HAZARDOUS

Permit Number: MI-055-1I-C001

Well Name: Weber 4-8

Pursuant to the Underground Injection Control regulations of the U.S. Environmental Protection Agency codified at Title 40 of the Code of Federal Regulations (40 CFR), Parts 124, 144, 146, and 147,

Team Completions, LLC of Kalkaska, Michigan

is hereby authorized to operate a commercial Class I non-hazardous injection well located in Michigan, Grand Traverse County, T25N, R11W, Section 8, NE Quarter Section, for injection into the Traverse Limestone at depths between 1750 feet and 2200 feet upon the express condition that the permittee meet the restrictions set forth herein.

All references to Title 40 of the Code of Federal Regulations are to all regulations that are in effect on the date that this permit becomes effective. The following attachments are incorporated into this permit: A, B, C, D, E, F, G and H.

This permit shall become effective on _____, and shall remain in full force and effect during the life of the permit, unless this permit is revoked, terminated, modified or reissued pursuant to 40 CFR 144.39, 144.40 or 144.41.

This permit and authorization to inject shall expire at midnight on _____ , unless terminated prior to the expiration date.

Signed and Dated: _____

DRAFT

Tinka G. Hyde
Director, Water Division

PART I

GENERAL PERMIT COMPLIANCE

A. EFFECT OF PERMIT

The permittee is allowed to engage in underground injection in accordance with the conditions of this permit. Notwithstanding any other provisions of this permit, the permittee authorized by this permit shall not construct, operate, maintain, convert, plug, abandon, or conduct any other injection activity in a manner that allows the movement of injection, annulus or formation fluids into underground sources of drinking water (USDWs). The objective of this permit is to prevent the introduction of contaminants into USDWs if the presence of that contaminant may cause a violation of any primary drinking water regulation under 40 CFR Part 141 or may otherwise adversely affect the health of persons. Any underground injection activity not specifically authorized in this permit is prohibited. For purposes of enforcement, compliance with this permit during its term constitutes compliance, with Part C of the Safe Drinking Water Act (SDWA). Such compliance does not constitute a defense to any action brought under Section 1431 of the SDWA, or any other common or statutory law other than Part C of the SDWA. Issuance of this permit does not convey property rights of any sort or any exclusive privilege; nor does it authorize any injury to persons or property, any invasion of other private rights, or any infringement of State or local law or regulations. Nothing in this permit shall be construed to relieve the permittee of any duties under applicable regulations.

B. PERMIT ACTIONS

1. **Modification, Revocation, Reissuance and Termination** - The Director of the Water Division of the United States Environmental Protection Agency (EPA), hereinafter, the Director, may, for cause or upon request from the permittee, modify, revoke and reissue, or terminate this permit in accordance with 40 CFR 144.12, 144.39, and 144.40. Also, the permit is subject to minor modifications for cause as specified in 40 CFR 144.41. The filing of a request for a permit modification, revocation and reissuance, or termination, or the notification of planned changes, or anticipated noncompliance on the part of the permittee does not stay the applicability or enforceability of any permit condition.

2. **Transfer of Permits** - This permit is not transferable to any person except in accordance with 40 CFR 144.38.

C. SEVERABILITY

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

D. CONFIDENTIALITY

In accordance with 40 CFR Part 2 and Section 144.5, any information submitted to EPA pursuant to this permit may be claimed as confidential by the submitter. Any such claim must be asserted at the time of submission by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, EPA may make the information available to the public without further notice. If a claim is asserted, the validity of the claim will be assessed in accordance with the procedures in 40 CFR Part 2 (Public Information). Claims of confidentiality for the following information will be denied:

1. The name and address of the permittee; and

2. Information which deals with the existence, absence or level of contaminants in drinking water.

E. DUTIES AND REQUIREMENTS

1. **Duty to Comply** - The permittee shall comply with all applicable Underground Injection Control (UIC) Program regulations and conditions of this permit, except to the extent and for the duration such noncompliance is authorized by an emergency permit issued in accordance with 40 CFR 144.34. Any permit noncompliance constitutes a violation of the SDWA and is grounds for enforcement action, permit termination, revocation and reissuance, modification, or for denial of a permit renewal application.

2. **Penalties for Violations of Permit Conditions** - Any person who violates a permit requirement may be subject to civil penalties, fines and other enforcement action under the SDWA. Any person who willfully violates permit conditions may be subject to criminal prosecution.

3. **Continuation of Expiring Permits**

   (a) **Duty to Reapply** - If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must submit a complete application for a new permit at least 60 calendar days before this permit expires.

   (b) **Permit Extensions** - The conditions of an expired permit may continue in force in accordance with 5 U.S.C. 558(c) and 40 CFR 144.37.

   (c) **Effect** - Permits continued under 5 U.S.C. 558(c) and 40 CFR 144.37 remain fully effective and enforceable.

   (d) **Enforcement** - When the permittee is not in compliance with the conditions of the expiring or expired permit, the Director may choose to do any or all of the following:

      (1) Initiate enforcement action based upon the permit which has been continued;

(2) Issue a notice of intent to deny the new permit in which case, the owner or operator would then be required to cease the activities authorized by the continued permit or be subject to enforcement action for operation without a permit;

(3) Issue a new permit under 40 CFR Part 124 with appropriate conditions; or

(4) Take other actions authorized by the UIC regulations.

(e) **State Continuation** - An EPA-issued permit does not continue in force beyond its expiration date under Federal law if at that time a State has primary enforcement responsibility under the SDWA. A State authorized to administer the UIC program may continue either EPA or State-issued permits until the effective date of the new permits, if State law allows. Otherwise, the facility or activity is operating without a permit from the time of expiration of the old permit to the effective date of the State-issued new permit. Furthermore, if the State does not continue the EPA permit upon obtaining primary enforcement responsibility, the permittee must obtain a new State permit or be authorized to inject by State rule. Failure to do so while continuing to operate the well constitutes unauthorized injection and is a violation subject to enforcement action.

4. **Need to Halt or Reduce Activity Not a Defense** - It shall not be a defense for the permittee in an enforcement action to claim that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

5. **Duty to Mitigate** - The permittee shall take all timely and reasonable steps necessary to minimize or correct any adverse impact on the environment resulting from noncompliance with this permit.

6. **Proper Operation and Maintenance** - The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this permit.

7. **Duty to Provide Information** - The permittee shall furnish to the Director, within a time specified, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

8. **Inspection and Entry** - The permittee shall allow the Director or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

   (a) Enter, at reasonable times, upon the permittee's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this permit;

   (b) Have access to and copy, at reasonable times, any records that are kept under the conditions of this permit;

   (c) Inspect, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and

   (d) Sample or monitor, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the SDWA, any substances or parameters at any facilities, equipment or operations regulated or required under this permit.

9. **Records**

   (a) The permittee shall retain records and all monitoring information, including all calibration and maintenance records and all original chart recordings for continuous monitoring instrumentation and copies of all reports required by this permit for a period of at least three (3) years from the date of the sample, measurement or report, unless these materials are submitted to the Director as part of reporting requirements under this permit.

   (b) The permittee shall maintain records of all data required to complete the permit application form for this permit and any supplemental information submitted under 40 CFR 144.27, 144.28, and 144.31 for a period of at least three (3) years from the date the application was signed.

   (c) The permittee shall retain records concerning the nature and composition of all injected fluids until three (3) years after the completion of plugging and abandonment of this injection well.

   (d) The retention period specified in Part I(E)(9)(a) through (c) of this permit may be extended by request of the Director at any time. The permittee shall continue to retain records after the retention period specified in Part I(E)(9)(a) through (c) of this permit or any requested extension thereof expires unless the permittee delivers the records to the Director or obtains written approval from the Director to discard the records.

   (e) Records of monitoring information shall include:

      (1) The date, exact place, and time of sampling or measurements;

(2) The name(s) of individual(s) who performed the sampling or measurements;

(3) A precise description of both sampling methodology and the handling of samples;

(4) The date(s) analyses were performed;

(5) The name(s) of individual(s) who performed the analyses;

(6) The analytical techniques or methods used; and

(7) The results of such analyses.

10. **Monitoring** - Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. The permittee shall use the methods described in "Test Methods for the Evaluation of Solid Waste, Physical/Chemical Methods" (available from Solid Waste Information, EPA, 26 W. St. Claire St., Cincinnati, Ohio 45268), or equivalent methods approved by the Director, to take representative samples. Monitoring results shall be reported at the intervals contained in Part II(D)(1) through (4) and Part III(A) of this permit.

(a) Monitoring of the nature of injected fluids shall comply with applicable analytical methods cited and described in Table I of 40 CFR 136.3 or in certain circumstances by other methods that have been approved by the Director.

(b) Sampling and analysis shall comply with the specifications of the Waste Analysis Plan required in Part II(C)(3) of this permit.

11. **Signatory Requirements** - All reports or other information, required to be submitted by this permit or requested by the Director shall be signed and certified in accordance with 40 CFR 144.32.

12. **Reporting Requirements**

(a) **Planned Changes** - The permittee shall give written notice to the Director, as soon as possible, of any planned physical alterations or additions to the permitted facility other than minor repair/replacement maintenance activities.

(b) **Anticipated Noncompliance** - The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

(c) **Compliance Schedules** - Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted by the permittee no later than thirty (30) calendar days following each schedule date.

(d) **Twenty-four Hour Reporting**

(1) The permittee shall report to the Director any permit noncompliance which may endanger health or the environment. See, e.g. Part I(G)(5) of this permit. Any information shall be provided orally within twenty-four (24) hours from the time the permittee becomes aware of the circumstances. Such reports shall include, but not be limited to the following information:

(i) Any monitoring or other information which indicates that any contaminant may cause an endangerment to an USDW; and

(ii) Any noncompliance with a permit condition, or malfunction of the injection system, which may cause fluid migration into or between USDW; and

(iii) Any failure to maintain mechanical integrity.

(2) A written submission shall also be provided within five (5) working days of the time the permittee becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the noncompliance.

(e) **Other Noncompliance** - The permittee shall report all other instances of noncompliance not otherwise reported at the time monitoring reports are submitted. The reports shall contain the information listed in Part I(E)(12)(d)(2) of this permit.

(f) **Other Information** - When the permittee becomes aware of failure to submit any relevant facts in the permit application or that incorrect information was submitted in a permit application or in any report to the Director, the permittee shall submit such facts or corrected information within ten (10) calendar days.

(g) **Report on Permit Review** - Within thirty (30) calendar days of receipt of this permit, the permittee shall certify to the Director that he or she has read and is personally familiar with all terms and conditions of this permit.

F. PLUGGING AND ABANDONMENT

1. **Notice of Plugging and Abandonment** - The permittee shall notify the Director at least sixty (60) calendar days before conversion or abandonment of the well. At the discretion of the Director, a shorter notice period may be allowed.

2. **Plugging and Abandonment** - The permittee must receive the approval of the Director before plugging the well and shall plug and abandon the well consistent with 40 CFR 144.52(a)(6) and 146.10, as provided for in the Plugging and Abandonment Plan contained in Part III(B) of this permit. Within sixty (60) calendar days after plugging a well, or at the time of the next quarterly report (whichever is shorter), the permittee shall submit a Plugging and Abandonment report to the Director. The report shall be certified as accurate by the permittee and by the person who performed the plugging operation (if other than the permittee), and shall consist of either:

   (a) A statement that the well was plugged in accordance with the Plugging and Abandonment Plan previously approved by the Director; or

   (b) If the actual plugging differed from the approved plan, a statement defining the actual plugging and explaining why the Director should approve such deviation. If the Director determines that a deviation from a previously approved plan may endanger underground sources of drinking water, the permittee shall replug the well as required by the Director.

3. **Temporary Abandonment** - If the permittee ceases injection into the well for twenty-four (24) consecutive months, the well is considered to be in temporary abandoned status, and the permittee shall plug and abandon the well in accordance with the approved plan and 40 CFR 144.52 (a)(6), or make another demonstration of non-endangerment (e.g., a standard annulus pressure test). During any periods of temporary abandonment or disuse, the well will be tested to ensure that it maintains mechanical integrity. Demonstrations of non-endangerment/testing will be due every two years from the last successful test (unless the permit requires more frequent demonstrations of mechanical integrity). If the well loses mechanical integrity prior to the next test due date, then the well must either be plugged or repaired and retested within 30 days of losing mechanical integrity. The permittee shall continue to comply with the conditions of this permit, including all monitoring and reporting requirements according to the frequencies outlined in the permit unless an exception to such requirements is granted, in writing, by the Director.

4. **Revision of Plugging and Abandonment Plan** - If the permittee finds it necessary to change a Plugging and Abandonment Plan, a revised plan shall be submitted to the Director for approval at the time of the next monthly report.

5. **Standards for Well Closure - Prior to plugging and abandoning the well:**

   (a) The permittee shall observe and record the reservoir pressure decay for a time specified by the Director and shall report this information to the Director.

   (b) The permittee shall conduct appropriate mechanical integrity testing to ensure the integrity of that portion of the long string casing and cement that will be left in the ground after closure. Testing methods must include:

(1) Pressure tests with liquid;

(2) Noise, temperature, or oxygen activation logs; and

(3) Any other test required by the Director.

(c) Prior to well closure, the well shall be flushed with a buffer fluid.

G. MECHANICAL INTEGRITY

1. **Standards** - The injection well must have and maintain mechanical integrity consistent with 40 CFR 146.8(a)(1) and (2). Mechanical integrity demonstrations must be witnessed by an authorized representative of the Director. Mechanical integrity testing may also be conducted without an EPA authorized representative when it is not possible for the UIC Branch to resolve scheduling conflicts with both EPA contract inspectors and the regional technical staff. In order to ensure that unwitnessed test will be properly conducted, the permittee will be required to submit test procedures to the UIC Branch for review and wait for written approval from the UIC Branch prior to testing.

2. **Periodic Mechanical Integrity Testing [§146.8]** - The permittee shall conduct the mechanical integrity testing as follows:

   (a) Long string casing, injection tubing and annular seal shall be tested by means of an approved pressure test in accordance with 40 CFR 146.8(b)(2). This test shall be performed at least once every twelfth month beginning with the date of the last approved demonstration and whenever there has been a well workover in which tubing is removed from the well, the packer is reset, or when loss of mechanical integrity becomes suspected during operation;

   (b) An approved temperature, noise, oxygen activation, or other approved log shall be run upon completion of this well and at least once every sixty (60) months from the date of the last approved demonstration to test for movement of fluid along the bore hole. The Director may require such tests whenever the well is worked over. The permittee must submit logging procedures to the Director for approval before running logs for the purpose of meeting this requirement;

   (c) The permittee may request the Director to use any other test approved by the Director in accordance with the procedures in 146.8(d).

3. **Prior Notice and Reporting** - The permittee shall notify the Director of his or her intent to demonstrate mechanical integrity for periodically scheduled test events at least thirty (30) calendar days prior to such demonstration. At the discretion of the Director a shorter time period may be allowed. Reports of mechanical integrity demonstrations which include logs must include an interpretation of results by a knowledgeable log analyst. The permittee shall

report the results of a mechanical integrity demonstration within forty-five (45) calendar days or with the next quarterly report after completion thereof.

4. **Gauges** - The permittee shall calibrate all gauges used in mechanical integrity demonstrations to an accuracy of not less than one-half (0.5) percent of full scale, prior to each required test of mechanical integrity. A copy of the calibration certificate shall be submitted to the Director or his or her representative at the time of demonstration and every time the gauge is calibrated. The gauge shall be marked in no greater than five (5) psi increments. The Densitometer shall be calibrated using an air check or liquid check every twelve (12) months in accordance with manufacturers' recommendation.

5. **Loss of Mechanical Integrity** - If the permittee or the Director finds that the well fails to demonstrate mechanical integrity during a test, or fails to maintain mechanical integrity during operation, or that a loss of mechanical integrity as defined by 40 CFR 146.8(a)(1) and (2) is suspected during operation, the permittee shall halt the operation immediately and follow the reporting requirements as directed in Part I(E)(12) of this permit. The permittee shall not resume operation until mechanical integrity is demonstrated and the Director gives approval to recommence injection.

6. **Mechanical Integrity Testing on Request From Director** - The permittee shall demonstrate mechanical integrity at any time upon written notice from the Director.

H. FINANCIAL RESPONSIBILITY

1. **Financial Responsibility** - The permittee shall maintain financial responsibility and resources to close, plug, and abandon the underground injection operation in a manner consistent with 40 C.F.R. 144.52 (a)(7). The approved financial assurance mechanism is found in the administrative record for this permit.

   (a) The permittee must maintain a written cost estimate, in current dollars, for the Plugging and Abandonment Plan as specified in 40 CFR 146.10. The plugging and abandonment cost estimate at any point in the life of the facility operation must equal the maximum cost of plugging and abandonment at that time.

   (b) The permittee must revise the plugging and abandonment cost estimate whenever a change in the Plugging and Abandonment Plan increases the cost of plugging and abandonment. For required annual updates of the cost estimate, an inflation factor will be applied to the previous estimate or an independent estimate may be used to establish the current Plugging and Abandonment cost.

   (c) If the revised plugging and abandonment estimate exceeds the current amount of the financial assurance mechanism, the permittee shall submit a

revised mechanism to cover the increased cost within thirty (30) calendar days after the revision specified in Part I(H)(1)(b) of this permit.

2. **Insolvency** - The permittee must notify the Director within ten (10) calendar days of any of the following events:

   (a) The bankruptcy of the trustee or issuing institution of the financial mechanism; or

   (b) Suspension or revocation of the authority of the trustee institution to act as trustee; or

   (c) The institution issuing the financial mechanism losing its authority to issue such an instrument.

3. **Notification** - The permittee must notify the Director by certified mail of the commencement of voluntary or involuntary proceedings under Title 11 (Bankruptcy), U.S. Code naming the owner or operator as debtor, within ten (10) calendar days after the commencement of the proceeding. A guarantor of a corporate guarantee must make such a notification if he or she is named as debtor, as required under the terms of the guarantee.

4. **Establishing Other Coverage** - The owner or operator must establish other financial assurance or liability coverage acceptable to the Director, within sixty (60) calendar days of the occurrence of the events in Part I(H)(2) or (H)(3) of this permit.

I. CORRECTIVE ACTION

1. **Compliance** - The permittee shall comply with the plan for contingency corrective action which is found in Part III (D) of this permit and with 40 CFR 144.55 and 146.7.

2. **Corrective Action Plan** - The permittee shall file a Corrective Action Plan for approval by the Director within thirty (30) days of a written determination by the Director that improperly plugged, completed, or abandoned wells, or wells for which plugging or completion information is unavailable, are present in the area of review and penetrate the confining zone of the permitted well, as defined in the administrative record for this permit.

3. **Prohibition of Movement of Fluids into USDWs (§144.12)** - Should upward migration of fluids through the confining zone of this permitted well be discovered within the two mile area of review, and should this migration of fluids cause the introduction of any contaminant into a USDW pursuant to 40 CFR 144.12, the permittee shall immediately cease injection into this well until the situation has been corrected and reauthorization to inject has been given by the Director.

PART II

WELL SPECIFIC CONDITIONS FOR UIC PERMITS

A. CONSTRUCTION

1. **Siting [§146.12(a)]** - The injection well shall inject only into the formation and depths listed on the cover page of this permit. At no time shall injection occur into a formation which is or is above the lowermost formation containing, within one quarter mile of the well bore, an underground source of drinking water.

2. **Casing and Cementing [§146.12(b)]** - Notwithstanding any other provisions of this permit, the permittee shall case and cement the well in such a manner so as to prevent the movement of fluids into or between USDWs for the expected life of the well. The casing and cement used in the construction of this well are shown in Part III(E) of this permit and in the administrative record for this permit. Any change shall be submitted for approval by the Director before installation.

3. **Tubing and Packer Specifications [§146.12(c)]** - The permittee shall inject only through tubing with a packer set within the long string casing at a point within or below the confining zone. The tubing and packer used in the well are represented in engineering drawings contained in Part III(E) of this permit. Any change shall be submitted for approval by the Director before installation.

4. **Wellhead Specification [§144.51(i)(4)]** - The permittee shall install and maintain a female coupling and valve on the wellhead, to be used for independent injection pressure readings. Further, the permittee shall install a sampling port for waste sampling consistent with the permittee's waste sampling procedures, if applicable.

5. **Site Security** – In order to prevent any illegal dumping into the injection well, the operator must construct a fence with a padlocked gate around the facility to preclude access of unauthorized personnel.

B. OPERATIONS [§146.13]

1. **Injection Pressure Limitation** - Except during stimulation, the permittee shall not cause or permit the injection pressure at the wellhead to exceed the maximum limitation which is specified in Part III(A) of this permit. In no case shall injection pressure initiate fractures or propagate existing fractures in the confining zone or cause the movement of injection or formation fluids into a USDW.

2. **Additional Injection Limitation** - No waste streams other than those identified in Part III(F) of this permit shall be injected. The permittee shall submit a certified statement attesting to compliance with this requirement at the time of the annual report.

3. **Annulus Fluid and Pressure** - The permittee shall fill the annulus between the tubing and the long string casing with a fluid approved by the Director and

identified in the administrative record of this permit. Any change in the annulus fluid, except during workovers or times of annulus maintenance, shall be submitted by the permittee for the approval of the Director before replacement. Except during workovers, the permittee shall maintain a positive pressure on the annulus as specified in Part III(A) of this permit.

4. **Annulus/Tubing Pressure Differential** - Except during workovers or times of annulus maintenance, the permittee shall maintain, over the entire length of the tubing, a pressure differential between the tubing and annulus as specified in Part III(A) of this permit.

5. **Automatic Warning and Automatic Shut-off System** - The permittee shall continuously operate and maintain an automatic warning and shut-off system to stop injection within fifteen (15) minutes of any of the following situations:

   (a) Pressure changes in the annulus or annulus/tubing differential signifying or identifying possible deficiencies in mechanical integrity; or

   (b) Injection pressure, annulus pressure, or annulus/tubing differential pressure reaches the pressure limits as specified in Part III(A) of this permit.

   The permittee must test the automatic warning and automatic shut-off system at least once every twelfth month. This test must involve subjecting the system to simulated failure conditions and must be witnessed by the Director or his or her representative, unless alternative arrangements are approved by the Director. Unless a trained operator is present on site property who is able to perceive shut-down alarms and is able to respond to the well controls or the wellhead within fifteen (15) minutes of a compliance alarm condition at all times when the well is operating, the special permit conditions related to the remote monitoring of the well in Part (H) of this permit shall apply.

6. **Precautions to Prevent Well Blowouts** - In order to prevent the migration of fluids into underground sources of drinking water, the permittee shall maintain on the well at all times, a pressure which will prevent the return of the injection fluid to the surface. If there is gas formation in the injection zone near the well bore, such gas must be prevented from entering the casing or tubing. The well bore must be filled with a high specific gravity fluid during workovers to maintain a positive (downward) gradient and/or a plug shall be installed which can resist the pressure differential. If the potential for blowout exists, a blowout preventer must be kept in proper operational status during workovers. In cases where the injected wastes have the potential to react with the injection formation to generate gases, the permittee shall follow the procedures below to assure that a backflow or blowout does not occur:

   (a) Limit the temperature, pH or acidity of the injected waste prior to a workover; and

(b) Develop procedures necessary to assure that pressure imbalances do not occur.

C. MONITORING

1. **Sampling Point** - The injection fluid samples shall be taken at the sampling location as specified in Part III(A) of this permit.

2. **Continuous Monitoring Devices** - The permittee shall maintain continuous monitoring devices and use them to monitor injection pressure, flow rate, and the pressure on the annulus between the tubing and the long string of casing. If the well is equipped with a fluid level indicator, the permittee shall monitor the fluid level daily. The monitoring results shall be submitted to the Director as specified in Part II(D) of this permit. The permittee shall maintain for EPA's inspection at the facility an appropriately scaled, continuous record of these monitoring results as well as original copies of any digitally recorded information pertaining to these operations.

3. **Waste Analysis Plan [§144.52(a)(5)]** - The permittee shall comply with the written Waste Analysis Plan which describes the procedures used to monitor the nature of injected fluids and the procedures which will be carried out to comply with Part I(E)(10) of permit. A copy of the approved plan shall also be kept at the facility.

4. **Ambient Monitoring [146.13(d)(1)]** - The permittee shall monitor the pressure buildup in the injection zone at least once every twelfth month from the last approved demonstration, including at a minimum, a shut down of the well for a time sufficient to conduct a valid observation of the pressure fall-off curve. From this observation, the permittee shall submit a report including at least a calculation of pressure build-up in the injection zone, injection zone transmissivity, and wellbore skin factor.

5. **Temperature Monitoring** – The permittee shall monitor injectate temperature at least once daily on each day during which injection occurs. If injection occurs during more than one eight-hour period in a day, temperature must be recorded at least once every six hours. The monitoring results shall be submitted to the Director as specified in Part II(D)(1)(g) of this permit.

D. REPORTING REQUIREMENTS [§146.13(c)]

The permittee shall submit all required reports to the Director at:

United States Environmental Protection Agency
77 West Jackson Boulevard (WU-16J)
Chicago, Illinois 60604-3590
ATTN: UIC Branch, Direct Implementation

1. **Monthly Reports** - The permittee shall submit monthly reports of the following information no later than the end of the month following the reporting period:

   (a) Waste analysis results per the approved waste analysis plan. Laboratory reports must be submitted with the first monthly monitoring report following their receipt by the operator;

   (b) A tabulation of maximum injection pressure, a daily measurement of annulus tank fluid level, and minimum differential between simultaneous measurements of injection pressure and annulus pressure for each day of the month;

   (c) Appropriately scaled graphs showing injection pressure and flow rate and annulus tank fluid level. One graph must include, at a minimum, daily maximum injection pressure and daily average flow rate, on a single, monthly chart;

   (d) A statement of the total volumes of the fluid injected to date, in the current calendar year, and the current month;

   (e) A tabulation of the dates, amounts and types of liquid added to or removed from the annulus system during the month, and the cumulative additions and cumulative subtractions for the current month and each of the past 12 months;

   (f) Any noncompliance with conditions of this permit, including but not limited to:

      (1) or injection pressure or annulus/tubing differential as specified in the permit; or

      (2) Any event which triggers an alarm or shutdown device required in Part II(B)(5) of this permit.

   (g) The monthly average of the measured values of injectate temperature. If temperature measurements are recorded when the well is not injecting, those measurements will not be included in calculating the monthly average. Records of all temperature measurements must be maintained in accordance with Part I(E)(9)(a) of this permit

2. **Quarterly Reports** - The permittee shall report the following at least every Quarter (quarterly reporting periods shall begin on the first day of January, April, July, and October of each year).

   (a) Results of the injection fluid analyses specified in Parts III (A) and (G) of this permit, if applicable. Laboratory reports must be submitted with the first monthly monitoring report following the close of the quarterly reporting period.

(b) Part III (A) of this permit specifies the method for determining reporting of sampling and analysis more frequent than quarterly.

3. **Annual Reports** - The permittee shall report the following at least every twelfth month:

(a) Results of the injection fluid analyses specified in the approved waste analysis plan as recorded in the administrative record for this permit. This report must include statements showing that the requirements of Part I(E)(10), Part I(G)(4), Part II (B)(2), Part II (B)(5), and Part II(D)(1)(e) have been met; and

(b) Results of ambient monitoring required by 40 CFR 146.13(d)(1) and Part II(C)(4) of this permit.

4. **Reports on Well Tests and Workovers** - Within forty-five (45) calendar days or within the next quarterly report after the activity, the permittee shall report to the Director the results of demonstrations of mechanical integrity, any well workover, or results of other tests required by this permit.

PART III

ATTACHMENTS

These attachments include, but are not limited to, permit conditions and plans concerning operating procedures, monitoring and reporting, as required by 40 CFR Parts 144 and 146. The permittee shall comply with these conditions and adhere to these plans as approved by the Director, as follows:

A. SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS (ATTACHED)

B. PLUGGING AND ABANDONMENT PLAN (ATTACHED)

C. FINANCIAL ASSURANCE MECHANISM (ATTACHED)

D. CONTINGENT CORRECTIVE ACTION (ATTACHED)

E. CONSTRUCTION DETAILS (ATTACHED)

F. SOURCE AND ANALYSIS OF WASTE (ATTACHED)

G. WASTE ANALYSIS PLAN (ATTACHED)

H. SPECIAL CONDITIONS RELATED TO REMOTE MONITORING (ATTACHED)

ATTACHMENT A
SUMMARY OF OPERATING, MONITORING AND REPORTING REQUIREMENTS

CHARACTERISTICS	LIMITATION	MINIMUM MONITORING FREQUENCY	MINIMUM REPORTING FREQUENCY
Injection Pressure[1]	to be determined	continuous	monthly
Annulus Pressure	100 psig minimum	continuous	monthly
Annulus/Injection Pressure Differential	100 psig minimum	continuous	monthly
Flow Rate	73 gpm	continuous	monthly
Annulus Fluid Level		daily	monthly
Annulus Fluid Loss		monthly	monthly
Cumulative Volume		continuous	monthly
Temperature[2]		daily[2]	monthly
Toxicity Characteristic List (Class I fluids)		see Part III(F)	monthly
Fingerprint Analysis (Class I fluids)		see Part III(F)	monthly
Chemical Composition and Physical Characteristics of Injected Oilfield Brine[3]		see Part III(F)	quarterly

[1] The limitation on injection pressure will serve to prevent injection-formation fracturing. This limitation was calculated using the following formula: [{0.80 psi/ft -(0.433 psi/ft)(specific gravity)} × depth]-14.7 psi. The maximum injection pressure is dependent upon the depth and specific gravity of the injected fluid. The Traverse Limestone at 1750 feet was used as the depth and a specific gravity of 1.35 was used for the injected fluid. The fracture gradient (0.80 psi/ft) is used as a default value, unless a site-specific value is determined pursuant to Part III(A)(B) of this permit, in which case the maximum injection pressure will be modified to reflect the specific value of the fracture gradient in this well. Such modification shall be considered a minor modification as allowed for at 40 CFR §144.41(f). The limitation on injection pressure will serve to prevent injection-formation fracturing.

[2] Frequency of temperature measurements will be in accordance with Section II(C)(5) of this permit. Reporting of injectate temperature will be in accordance with Section II(D)(1)(g) of this permit.

Maximum Injection Pressure (146.13)

1. During construction of this well, the permittee shall determine if the maximum injection pressure as specified at Part III(A) of this permit allows sufficient operational flexibility. If sufficient flexibility is allowed for in the maximum injection pressure, the permittee may opt not to proceed with additional testing and the requirements of Part III(A)(B) of this permit shall be met. If the maximum injection pressure calculated prior to direct testing proves insufficient, or another need is identified that requires modifying the maximum injection pressure, the permittee shall conduct one or more of the following tests to ensure that the maximum injection pressure exerted during operation will not propagate existing or open new fractures in any part of the injection zone. In all cases, the permittee shall submit a plan, for the Director's approval, describing the detailed procedures to be followed during any test designed to determine maximum injection pressure. Modification of the maximum permitted injection pressure following a test conducted under Part III(A)(B) of this permit shall follow the procedures set forth for minor permit modifications, as specified at 40 CFR §144.41(f).

   (a) **In-Situ Stress Tests**

   The permittee shall isolate zones for testing the fracturing pressure by means of a straddle packer assembly, or other comparable means. The zones chosen for testing shall be those predicted to have the lowest fracturing value. The permittee shall use either fresh water to conduct this test or a fluid that is permissible for injection into this well as allowed by this permit. At a minimum, the permittee shall measure the test fluid for its specific gravity and viscosity during the In-Situ Stress test. The results of this test shall be submitted to the USEPA as specified at Part III(A)(B)(2) of this permit. Failure to report test results shall be considered grounds to deny a requested permit modification.

   (b) **Step Rate Test**

   The permittee shall isolate the entire injection zone by means of a packer assembly, or other comparable means. The permittee shall inject either fresh water for this test or a fluid that is permissible for injection into this well as allowed for in this permit. At a minimum, the permittee shall measure the test fluid for its specific gravity and viscosity during the Step Rate Test. The permittee shall inject into the well at increasing rates,

---

[3] As specified in Part III(F) of this permit and the Waste Analysis Plan, found in the administrative record for this permit. At minimum, the daily monitoring of the physical characteristics of the injected fluids shall include the following parameters: Turbidity, pH and Specific Gravity, with monthly reporting of each.

holding each rate step constant. Each rate step shall span the same amount of time (at least 30 minutes per rate step is recommended). The permittee shall attempt to inject at three (3) rates which result in a pressure higher than the injection zone fracture pressure during this test. A Cartesian plot of rate against the final stabilized pressure at each step shall be included as part of the data package submitted to the USEPA. The results of this test shall be submitted to the USEPA as specified at Part III(A)(B)(2) of this permit. Failure to report test results shall be considered grounds to deny a requested permit modification.

(c) **Other Test(s) Approvable by the Director**

The permittee may choose to conduct test(s) other than the two described in Parts III(A)(B)(1)(a) and (b) of this permit. If so, the permittee shall submit a plan to conduct alternative test(s) to the Director for approval prior to conducting the test(s).

2. **Reporting Maximum Injection Pressure Determination**

The permittee shall report the results of the measurements, tests and determinations conducted in Parts III(A)(B)(1) of this permit within 30 days of their completion.

ATTACHMENT C
FINANCIAL ASSURANCE MECHANISM

Team Completions, LLC has demonstrated adequate financial responsibility to properly plug and abandon their Class I non-hazardous wells. A state bond in the amount of $30,000 has been established for this purpose with Northwestern Bank.

ATTACHMENT D
CONTINGENCY PLAN FOR CORRECTIVE ACTION

In order to ensure that the injection fluids will not migrate into underground sources of drinking water through improperly plugged or constructed wells within the two-mile area of review, the following equations were used to calculate a safe maximum injection rate of 73 gallons per minute (2503 barrels per day). This is based on the distance to the closest improperly plugged or constructed well.

Critical Pressure:

$$P_{crit} = P_{USDW} + \left(D_{IZ} - D_{USDW}\right) * 0.433 * sg - P_{IZ}$$

Zone of Endangering Influence:

$$ZEI = \sqrt{\frac{k * t}{\Phi * v_{eff} * c * 10^{\left(\frac{-P_{crit} * k * h}{162.6 * q * v_{eff}}\right)}}}$$

where P_{crit}=Critical Pressure (psi), P_{USDW}=Pressure at base of USDW (psi), P_{IZ}=Pressure at the top of the injection zone (psi), D_{IZ}=Depth to top of injection zone (ft), D_{USDW}=Depth to base of the USDW (ft), sg=specific gravity, ZEI=zone of endangering influence (ft), k=permeability (md), t=time (hrs), Φ=porosity, v_{eff}=effective viscosity (cp), c=compressibility (ft3/ft3/psi), h=thickness (ft), and q=rate (bpd).

Should upward fluid migration be detected through the well bore of any previously unknown, improperly plugged, completed or abandoned well in the area of review due to injection of permitted fluid, injection will immediately cease and EPA will be notified as required in Part I(E)(12)(d) of this permit. A Corrective Action Plan shall then be submitted as required in Part I(I)(2) of this permit.

Should a well failure occur in the Weber 4-8 injection well, Team Completions, LLC will shut the well in and follow the proper regulatory notification and repair procedures as required by Part I(E)(12)(d) of this Permit.

The corrective action plan that would be proposed by Team Completions, LLC should upward fluid migration through the confining layer be detected in any well bore will include the following:

1. The Weber 4-8 well will be shut-in.

2. EPA Region 5, UIC Branch, and the Michigan Department of Environmental Quality will be notified.

3. Following well shut-in, waste acceptance and/or generation will be stopped and/or will

be shipped to alternative permitted facilities for off-site treatment and disposal as necessary.

4. A contingency plan will be prepared as follows:

   a. Locate well and identify present operator or owner, if any.

   b. Identify mode of failure.

   c. Prepare remedial plan outlining course of action.

   d. The remedial plan will be submitted to EPA, Region 5 UIC Branch for approval.

   e. Upon authorization, the remediation plan will be implemented.

ATTACHMENT E
CONSTRUCTION DETAILS

Attached are diagrams of the well construction and wellhead schematic.

ATTACHMENT F
SOURCE AND ANALYSIS OF WASTE

1. General Requirements

Source of Waste - The Team Completions, LLC Weber 4-8 well is used primarily to dispose of oilfield brine brought to the surface during the production of oil and gas. Team Completions, LLC is also authorized to use the injection well to dispose of non-hazardous waste and wastes excluded from management under the Resource Conservation and Recovery Act, as specified at 40 CFR §261.4, provided the requirements regarding the new source as specified in this Attachment have been met.

Limitation - All fluids other than approved wastes entering this borehole must be approved by the Director for purposes of well testing, stimulation, workovers, or as buffer fluids.

Sampling location: The sampling location for new "sources" shall be at the site of generation. Previously approved sources may also be sampled at the site of generation or from a transport tank prior to unloading on-site. For on site generated waste, samples will be taken out at a sampling tap after filtration and prior to injection.

Waste Analysis Plan - This plan will be entered into this record and thus becomes an integral part of this permit.

2. Proposed New Waste Source Information

The information shown in Subparts a through f of this Attachment must be submitted by the permittee initially for each proposed waste source, pursuant to Part II(B)(2) of this permit. These requirements do not apply to existing wastes generated by the on-site plant operations at the facility and otherwise documented in this permit and the applicable permit application. The permittee may incorporate the information into a form of its own, provided that all information is included, and that the same form is used for all proposed sources. The permittee, by submitting appropriate knowledge of waste, shall specify that there are no hazardous wastes as defined at 40 CFR §§ 261.30-33 present in each proposed source. Appropriate knowledge of waste may consist of any or all of the following three categories: (1) knowledge of the waste generation process, (2) detailed record-keeping, or (3) waste analysis data.

The permittee must receive written authorization from EPA prior to injecting waste from a new source. Authorization shall consist of a final minor-modified permit, which shall list this source as an approved source in this Attachment. Upon receiving the minor-modified permit, the permittee shall be authorized to inject this waste, subject to the conditions of this permit and the permittee's approved waste analysis plan. EPA will make every reasonable effort to expedite the administrative processing of minor permit modifications.

a. Permittee Information
   1) Owner/Operator Name
   2) Owner/Operator Address (Street, City, State, Zip Code)
   3) Facility contact name and telephone number
   4) Well Location (Township, Range, Section, Quarter Section, footage NSL, EWL)
   5) EPA UIC Permit Number
   6) State Permit Number (if applicable)
   7) Well Name

b. Proposed Generator ("Source") Information

   1) Information required of all requested sources:

      a) Source Identification number (a unique number assigned to the waste generator at the site specified)
      b) Generator Name
      c) Generator Address (Street, City, State, Zip Code)
      d) Generator Contact Name and telephone number
      e) EPA Identification numbers (if applicable

   2) Oilfield waste sources must also include:

      a) Oilfield Name
      b) Location (Township, Range, and Section)
      c) Geologic Formation

c. Waste Transporter Information

   1) Transporter name
   2) Transporter Address (Street, City, State, Zip Code)
   3) Transporter Contact Name
   4) Transporter Contact phone number
   5) EPA Identification numbers (if applicable)

d. Waste Source Characterization (required of industrial waste)

   1) Sample analysis results, which include:

      a) Corrosivity
      b) Reactivity (as applicable to sample matrix)
      c) Ignitability
      d) Toxicity
      e) Conductivity
      f) Specific Gravity
      g) Temperature

h) All other constituents which are indicated by the generator as constituting a major portion of the waste stream (i.e., greater than 0.01 percent by mass).

The test for toxicity shall follow the Toxicity Characteristic Leaching Procedure and should include all appropriate constituents from the complete toxicity parameter list (which are listed at 40 CFR §261.24). Consistent with 40 CFR §262.11, the permittee may request a waiver from testing for corrosivity, reactivity, ignitability, or any of the constituents found at 40 CFR §261.24, based on knowledge of the hazard characteristic of the waste. In order to substitute "knowledge of waste" for testing, the permittee must submit a statement that describes how the materials and/or processes involved in the generation of the waste preclude the presence of the untested parameter(s).

2) Any appropriate analytical results necessary to identify waste constituents which may indicate a listed hazardous waste as defined at 40 CFR §§ 261.31, 261.32, 261.33, or 261.34.

3) Sampling and Analysis Description

a) The following information must be specified for each sampling event:
   (i) Sample collector, title, and employer
   (ii) Sample collection method and preservation technique
   (iii) Sample collection point

b) The following information must be specified for each parameter:
   (i) Analytical method for parameter detection/quantification
   (ii) Analytical method accuracy
   (iii) Upper and lower analytical method quantification limits

c) For parameters that were not analyzed for one or more hazard characteristics, a statement from the permittee which describes how the waste was determined to be nonhazardous.

e. Quality Assurance and Quality Control (QA/QC). A description of the following QA/QC Protocol followed:

1) Equipment cleaning blanks (if any)
2) Trip blanks (if any)
3) Sample duplicates (if any)
4) Chain of custody
5) Equipment calibration
6) Data reduction and validation

These requirements are specified in the QA/QC portion of the permittee's waste analysis plan.

f. Historical background of facility

Historical background of the facility, including a detailed description of the process involved in generating the waste, how it is collected and stored. Indicate whether the proposed waste source is a one-time source. The description should identify any periodic changes in facility operations which would be expected to alter the composition of the waste stream. The purpose of this information shall be to assure that the monitoring frequency applied to each source accounts for changes in the nature of the waste due to changes in facility operations. If a change in operations causes a change in the waste stream, the permittee must require monitoring which is representative of ongoing operations. Monitoring data supplied by the facility must be representative of the waste being generated for the entire period between sampling events.

3. Periodic Monitoring of Approved Sources

a. Nonhazardous industrial wastes

1) Toxicity Characteristic List (40 CFR §261.24). Fluid sampling constituents and frequencies shall be determined on a case-specific basis. Each source shall be sampled and analyzed according to the table in Subsection 4 below.

2) Fingerprint Analysis All wastes that require fingerprint analysis as specified in Part III(G) of this permit shall, at a minimum, be subject to tests for the following:

Specific Gravity, pH, Flashpoint, Total Suspended Solids, Conductivity, and any other analyses deemed appropriate for characterizing the injected waste.

b. Oilfield Brine Wastes.

All approved oilfield brine wastes shall be monitored at a minimum for the following parameters:

Sodium, Calcium, Magnesium, Barium, Total Iron, Chloride, Sulfate, Carbonate, Bicarbonate, Sulfide, Total Dissolved Solids, pH, Resistivity (ohm-meters @ 75°F), and Specific Gravity.

4. List of Presently-Approved Sources

a. Nonhazardous industrial waste fluids

Currently there is one approved source of industrial waste fluid being disposed of into the Weber 4-8 well. Additional industrial waste sources, as approved by the Director, will be identified in the table below by identification number, company name, location, as well as sampling frequency and analytical parameters. Certain waste sources may require more stringent sampling and analysis, which will be specified in this table.

Source ID Number	Source Name	Location (Address)	Waste Analysis Parameters	Waste Sampling Frequency
1-CL1	Glen's Sanitary Landfill, Inc.	518 Est Traverse Highway, Maple City, Michigan 49664	Toxicity Characteristic list (see 40 CFR §261.24) Fingerprint**	Annually Monthly

b. Oil Field Brines

Presently there are 100 approved proposed sources of oil field brine to be disposed of into the Weber 4-8 injection well. Future oilfield brine sources, as approved by the Director, will be identified in the table below by identification number, field name, location, as well as sampling frequency and analytical parameters.

CL2	Field Name	Location (T-R-S)	Formation Name	Frequency
1CL2	Kalkaska 17-27N-07W	Section 17-T27N-R7W	Niagaran	Annually
2CL2	Blue Lake 05-28N-05W	Section 05-T28N-R5W	Niagaran	Annually
3CL2	East Bay 05-26N-10W	Section 05-T26N-R10W	Niagaran	Annually
4CL2	Kalkaska 3	Section 03-T27N-R7W	Niagaran	Annually
5CL2	Colfax 31-25N-13W	Section 31-T25N-R12W	Niagaran	Annually
6CL2	East Bay 02A-26N-10W	Section 02-T26N-R10W	Niagaran	Annually
7CL2	Bear Lake 02A-23N-14W	Section 02-T23N-R15W	Niagaran	Annually
8CL2	Mentor	Section 32-T25N-R3E	St. Peter & P.D.C.	Annually
9CL2	Mentor 34	Section 34-T25N-R3E	St. Peter & P.D.C.	Annually
10CL2	Springdale 16	Section 16-T24N-R14W	Antrim	Annually

11CL2	Green Lake 12	Section 12-T26N-R12W	Antrim	Annually
12CL2	Grant 3	Section 03-T25N-R12W	Niagaran	Annually
13CL2	Blue Lake 04-28N-05W	Section 04-T28N-R5W	Niagaran	Annually
14CL2	Union 3	Section 03-T26N-R9W	Niagaran	Annually
15CL2	Big Creek 24	Section 24-T25N-R2E	St. Peter & P.D.C.	Annually
16CL2	Rapid River 27	Section 27-T28N-R7W	Niagaran	Annually
17CL2	Cold Springs 30	Section 30-T28N-R6W	Niagaran	Annually
18CL2	Grant 04-25N-12W	Section 04-T25N-R12W	Niagaran	Annually
		Section 09-T25N-R12W	Niagaran	Annually
19CL2	East Bay 16-26N-10W	Section 16-T26N-R10W	Niagaran	Annually
20CL2	East Bay 14	Section 14-T26N-R10W	Niagaran	Annually
21CL2	Kalkaska 10-27N-08W	Section 10-T27N-R8W	Niagaran	Annually
22CL2	Kalkaska	Section 16-T27N-R8W	Niagaran	Annually
23CL2	Kalkaska 19-27N-08W	Section 19-T27N-R8W	Niagaran	Annually
24CL2	Paradise 20A-26N-10W	Section 20-T26N-R10W	Niagaran	Annually
25CL2	MacDonald 10	Section 10-T26N-R10W	Niagaran	Annually
26CL2	East Bay 05-26N-10W	Section 05-T28N-R5W	Niagaran	Annually
27CL2	Blue Lake 18-28N-05W	Section 18-T28N-R5W	Niagaran	Annually
28CL2	Coldsprings 12-27N-06W	Section 12-T27N-R6W	Niagaran	Annually
29CL2	Excelsior 06-27N-07W	Section 6-T27N-R7W	Niagaran	Annually
30CL2	Bear Lake 24-23N-15W	Section 18-T23N-R15W	Niagaran	Annually
31CL2	Manistee 12/12A-22N-16W	Section12-T22N-R16W	Niagaran	Annually
32CL2	East Bay 10-26N-	Section 10-T26N-	Niagaran	Annually

	10W	R10W		
33CL2	Thompson Corners	Section 25-T15N-R15W	Clinton	Annually
34CL2	East Bay 09-26N-10W	Section 09-T26N-R10W	Niagaran	Annually
35CL2	Blair 11-26N-11W	Section 11-T26N-R11W	Niagaran	Annually
36CL2	East Bay 07-26N-10W	Section 07-T26N-R10W	Niagaran	Annually
37CL2	Mayfield 09-25N-11W	Section 09-T25N-R11W	Niagaran	Annually
38CL2	Bear Lake 09A-23N-15W	Section 09-T23N-R15W	Niagaran	Annually
39CL2	Springdale 16-24N-14W	Section 16-T24N-R14W	Niagaran	Annually
40CL2	Hayes 11-29N-04W	Section 11-T29N-R04W	Niagaran	Annually
41CL2	Wexford 01A-24N-12W	Section 01-T24N-R12W	Niagaran	Annually
42CL2	Brown 07-22N-15W	Section 07-T22N-R15W	Niagaran	Annually
43CL2	Cleon 19B-24N-13W	Section 19-T24N-R13W	Niagaran	Annually
44CL2	Paradise 22-26N-10W	Section 22-T26N-R10W	Niagaran	Annually
45CL2	Hayes 32-27N-04W	Section 32-T29N-R4W	Niagaran	Annually
46CL2	Otsego Lake 24-29N-03W	Section 24-T29N-R3W	Niagaran	Annually
47CL2	Whitewater 32-27N-09W	Section 32-T27N-R9W	Niagaran	Annually
48CL2	Bear Lake 20-23N-15W	Section 20-T23N-R15W	Niagaran	Annually
49CL2	East Bay 15-26N-10W	Section 15-T26N-R10W	Niagaran	Annually
50CL2	East Bay 11-26N-10W	Section 11-T26N-R10W	Niagaran	
51CL2	East Bay 16-26N-10W	Section 16-T26N-R10W	Niagaran	Annually
52CL2	Bear Lake 33	Section 33-T23N-R15W	Niagaran	Annually
53CL2	Manistee 12/12A-22N-16W	Section 07-T22N-R15W	Niagaran	Annually
	Bear Lake 25A-23N-15W	Section 19-T23N-R15W	Niagaran	Annually

54CL2		Section 26-T23N-R15W	Niagaran	Annually
55CL2	Kalkaska 11-27N-08W	Section 11-T27N-R8W	Niagaran	Annually
56CL2	Kalkaska 20/20A-27N-08W	Section 20-T27N-R8W	Niagaran	Annually
57CL2	Kalkaska 21-27N-08W	Section 21/22-T27N-R08W	Niagaran	Annually
58CL2	Kalkaska 30-27N-08W	Section 30-T27N-R8W	Niagaran	Annually
59CL2	Grant 29A-25N-15W	Section 29-T25N-R12W	Niagaran	Annually
60CL2	Mancelona 33-29N-05W	Section 04-T28N-R5W	Niagaran	Annually
61CL2	Grant 10-25N-12W	Section 10-T25N-R12W	Niagaran	Annually
62CL2	Bear Lake 01-23N-15W	Section 01-T23N-R15W	Niagaran	Annually
63CL2	Bear Lake 25-23N-15W	Section 25-T26N-R11W	Niagaran	Annually
64CL2	Blair 28-26N-11W	Section 29-T26N-R11W	Niagaran	Annually
65CL2	Enterprise	Section 11-T23N-R5W	Richfield & P.D.C.	Annually
66CL2	Filer 33-21N-17W	Section 33-T32N-R17W	Niagaran	Annually
67CL2	Garfield Sec 08	Section 14/15-T25N-R6W	Richfield & P.D.C.	Annually
68CL2	Manistee 25-22N-17W	Section 25-T22N-R17W	Niagaran	Annually
		Section 30-T22N-16W		Annually
69CL2	Norwich	Section 11-T24N-R5W	Richfield & P.D.C.	Annually
70CL2	Springfield Sec 32	Section 32-T25N-R08W	P.D.C.	Annually
71CL2	Big Creek	Section 8-T25N-R2E	P.D.C.	Annually
72CL2	Betts Creek	Section 1-T14N-R11W	Niagaran	Annually
73CL2	Rapid River Township Regional Gas	Section 5-T28N-R07W	Niagaran	Annually
74CL2	Blue Lake 01-28N-05W	Section 6-T28N-R04W	Niagaran	Annually
75CL2	Springdale	Section 15-T24N-	Guelph (Niagaran)	Annually

	Township Regional Oil	R14W		
		Section 16-T24N-14W		Annually
76CL2	Blair 34A-26N-11W	Section 34-T26N-11W	Brown Niagaran	Annually
77CL2	Grant 16-25N-12W	Section 16-T25N-R12W	Niagaran	Annually
78CL2	Frederic 02-28N-04W	Section 2-T28N-R4W	Niagaran	Annually
79CL2	Blue Lake 12A-28N-05W	Section 12-28N-R5W	Niagaran	Annually
80CL2	Coldsprings 22-28N-06W	Section 23-T28N-R6W	Niagaran	Annually
81CL2	Grant Township Regional Oil	Section 19-T25N-R12W	Guelph (Niagaran)	Annually
		Section 20-T25N-R12W		Annually
82CL2	Grant 34A-25N-12W	Section 34-T25N-R12W	Niagaran	Annually
83CL2	Wexford 1-6 CPF	Section 5/6-T24N-R12W	Niagaran	Annually
84CL2	Manistee 08-21N-16W	Section 8-T21N-R16W	Niagaran	
85CL2	Grant 34	Section 34-T25N-R12W	Niagaran	Annually
86CL2	Bear Lake 15	Section 15-T23N-R12W	Niagaran	Annually
87CL2	Yates 22 PDC	Section 27-T17N-R12W	P.D.C.	Annually
88CL2	Frederic 12-28N-04W	Section 12-T28N-R4W	Brown Niagaran	Annually
89CL2	Santiago	Section 23-T20N-R6E	P.D.C.	Annually
90CL2	Reno	Section 27-T22N-R5E	P.D.C.	Annually
91CL2	Mancelona 33A-29N-05W	Section 4-T28N-R5W	Niagaran	Annually
92CL2	Whitewater 22-27N-09W	Section 22-T27N-R9W	Niagaran	Annually
93CL2	Bear Lake 11A-23N-15W	Section 11-T23N-R15W	Niagaran	Annually
94CL2	Maple Grove 02-23N-14W	Section 2-T23N-R14W	Niagaran	Annually
95CL2	State Beaver	Section 21-T25N-	various	Annually

	Creek Plant 2	R4W		
96CL2	Otsego County – Antrim	Section 11-T30N-R3W	Antrim	Annually
97CL2	Manistee 36A-22N-17W	Section 26-T22N-R17W	Niagaran	Annually
98CL2	Grant 31-25N-12W	Section 6-T24N-12W	Niagaran	Annually
99CL2	Brown 05-22N-15W	Section 5-22N-15W	Niagaran	Annually
100CL2	West Branch	Section 18-T22N-R2E	Amherstburg	Annually

ATTACHMENT G
WASTE ANALYSIS PLAN

1. INTRODUCTION

1.A. Background

The purpose of the Waste Analysis Plan (WAP) is to characterize the non-hazardous waste water that is injected into the proposed Class I non-Hazardous Weber #4-8 disposal well at the Mayfield Township, Grand Traverse County, Michagn facility. Team Services will operate the well under this WAP in accordance with Title 40 of the Code of Federal Regulations (40 CFR), Section 146.13 that requires operators of Class I underground injection wells to monitor and analyze the fluids injected into the well "to yield representative data of their characteristics." This WAP has been prepared to fulfill the specifications of 40 CFR 146.68 such that the plan presents parameters for which the waste will be analyzed, methods that will be used to test for these parameters and methods that will be used to obtain representative samples of waste to be analyzed.

1.B. Waste Source

The Class I non-hazardous waste to be injected in the Weber #4-8 disposal well under this WAP include fluids that are to be recovered from oil and gas production well sites and leachate fluids. The fluids are to be comprised of brine brought to the surface during oil and gas production, leachate from a licensed non-hazardous landfill, along with any fluids generated during the operation and maintenance of the Class I injection well and the related unloading pad and surface facilities.

1.C. Summary

Major portions of the Team Services waste characterization and monitoring program related to the acceptance and the injection of off-site fluids consist of:

- Volume Monitoring
- Generator Certification Sampling and Analysis
- Quality Assurance/Quality Control

2. PROCEDURES

2.A. Waste Unloading and Volume Monitoring

Offloading of fluid transport will only be conducted with a Team Services trained operator physically present on site. A log sheet will be maintained on the site documenting that a trained well operator allowed waste to be unloaded. At a minimum, log sheet entries are to include operator name, date, time, approximate volume and truck or transport identification. Similar data may be obtained and recorded by filing manifest forms for deliveries. The log sheet(s) and/or manifests will be considered part of the plant monitoring record regarding the injection well.

A pressure/vacuum gauge will be utilized to monitor injection pressure. A pressure gauge will monitor annulus pressure. A flow measuring device will monitor flow rate and totalized

cumulative volumes. A summary of recorded data will be provided to the EPA and /or MDEQ per applicable permit requirements. Records of daily volume accepted from the offsite locations and any fluids managed from the onsite facility will be recorded and total monthly volume of injectate, calculated based on data maintained in the records, will be noted in the monthly well reports made to the EPA.

2.B. Waste Characterization

At a minimum, the following composition parameters will be monitored monthly for any month that fluid is injected. These paramters shall include:

Oilfield Brine Wastes
- Sodium
- Calcium
- Magnesium
- Barium
- Total Iron
- Chloride
- Sulfate
- Carbonate
- Bicarbonate
- Sulfide
- Total Dissolved Solids (TDS)
- pH
- Resistivity (ohm-meters @75° F)
- Specific Gravity

Landfill Leachate
- pH
- Total Dissolved Solids
- Conductivity
- Specific Gravity
- Nitrate Nitrogen
- Nitrite Nitrogen
- Ammonia Nitrogen
- Total Inorganic Nitrogen
- Volatile Organic Compounds (VOC)

2.C. Sampling and Analysis

Team Services, or contracted personnel will collect necessary waste stream samples. All sampling procedures will be conduced at the direction of the selected, certified analytical laboratory and in accordance with acceptable US EPA procedures. The sampler's name, sampling point, and date sampled will be documented in chain-of-custody paperwork. Samples will be collected with the grab method.

The table included below summarizes the analytical methods for typical parameters that may be included in the waste sampling for a particular waste source.

Test Parameter	Test Method	Units

Sodium	EPA 601 OB	mg/L
Calcium	EPA 601 OB	mg/L
Magnesium	EPA 601 OB	mg/L
Barium	EPA 601 OB	mg/L
Total Iron	EPA 200.7	mg/L
Chloride	EPA 300.0	mg/L
Sulfate	EPA 300.0	mg/L
Carbonate	EPA 310.1	mg/L
Bicarbonate	EPA 310.1	mg/L
Sulfide	EPA 376.1	mg/L
TDS	EPA 160.1	mg/L
pH	SW-846	pH units
Resistivity	ASTM2710F	
Specific Gravity	120.1	
Nitrate Nitrogen	EPA 300.0	
Nitrite Nitrogen	EPA 300.0	mg/L as N
Ammonia Nitrogen	EPA 350.1	mg/L as N
Total Inorganic Nitrogen	Calculated	mg/L as N
VOCs	EPA 8260	ug/L

Notes: Team Services reserves the right to select use of the cited method or method with equal or greater detection limits. Samples will be collected at the point of generation or at the Weber #4-8 facility from transport tanks prior to unloading wastes into storage or injection facilities.

3. QUALITY ASSURANCE/QUALITY CONTROL

3.A. General Sampling and Analytical Information

The sampling protocol will be followed by training personnel conducting the sample collection and analysis. Team services will adhere to guidelines set forth in "Test Methods for Evaluting Solid Waste", SW-846 and "Methods of Chemical Analysis of Water and Wastes", EPA 600/4-79/020 as appropriate. Approved sample preservation techniques for 40 CFR 136.3 will be followed as appropriate. These will include preservation in plastic or glass sample containers provided by the laboratory and storage in a sample refrigerator or cooler for shipment to the laboratory. Team Services reserves the option to choose suitable laboratories for testing provided equivalent QA/QC standards are met.

Standard chain of custody protocols will be followed for waste collection, transport and analysis. Below are summaries of the minimum sampling and analysis protocols which will be followed for each characterization parameter.

Labeling

1. Sampling name, date, and time
2. Name of sample collector; (including sampling company name if not Team Services)
3. Sample collection method
4. Sample collection point

Reporting

1. Sample preservation technique, as appropriate
2. Analytical method for parameter detection/quantification
3. Analytical method accuracy and quantification limits
4. Field documentation of sampling

The following are QA/QC parameters that will be followed to ensure the adequacy of the sampling and analytical techniques for wellhead sampling and analysis described in this plan.

3.B. Sampling Controls

3.B.1. Equipment Blanks

If possible, samples will be obtained directly from the sample tap or valve being used to access the tank or containment vessel and not be transferred to any secondary container or device before being stored in the sample container to be shipped to the laboratory. In this case, no equipment blanks will be required. If not, equipment blanks will be taken as deemed appropriate by Team Services for the purpose of detecting potential cross contamination due to improper decontamination of sampling equipment. After sampling, any secondary container or sampling device used will be decontaminated according to the sampling plan protocol. The sampling device will then be rinsed with deionized water and the rinsate collected in a sample container for transport to the laboratory for analysis of, at a minimum, the same parameters chosen in the sampling plan above.

3.B.2. Trip Blanks

In the case of suspect analysis from any laboratory, trip blanks will be used and will be sample containers filled with Type II reagent grade water at the laboratory, sealed at the laboratory, which accompany the sample containers used throughout the sampling event. The sampling containers shall be handled in the same manner as the samples. Trip blank(s) will be sent to the laboratory for analysis of at a minimum, the same parameters chosen in the sampling plan above. A minimum of one trip blank per sampling event will be utilized, if necessary.

3.B.3. Sample Duplicates

On advance written demand of EPA, duplicate samples will be taken to assess the QA/QC of the laboratory conducting the analysis. Such samples will be drawn from the same site from which primary samples are taken. Duplicate samples, if taken, will be split from the original sample in a manner to emphasize sample representativeness. The duplicate will be labeled with a sample number that will not conflict with the other samples, but will not be discernable to the laboratory as a duplicate sample. If requested by EPA or MDEQ, one duplicate sample per sampling event will be taken and analyzed for the same parameters listed in the sampling plan.

3.B.4. Sample Chain-of-Custody Protocol

Sample chain-of-custody will be followed at all times during the sampling and subsequent analysis. Chain-of-custody will be used to document the handling and control necessary to identify and trace a sample from collection to final analytical results.

3.C. Analytical Controls

3.C.1. Equipment Calibration
Selected laboratories will maintain QA/QC data in accordance with the laboratory's QA plan regarding the frequency and type of instrument calibration performed at the laboratory and in the field. Any calibration of thermometers, gauges, chromatographs, spectrometers and other meters will be conducted according to appropriate instrument manufacturer specifications and manufacturer recommended frequencies or as dictated by applicable laboratory QA plans.

3.C.2. Data Reduction
The process of transcription of the raw data into the reportable units will be conducted by the laboratory in accordance with the laboratory's QA plan. Data reduction utilized in the analysis and reporting process will be presented in the reports to the US EPA for each sampling event and parameter tested by the specific laboratory used at the time.

3.C.3. Data Verification
Data verification will be conducted in accordance with the selected laboratory's QA plan after each sampling event by assigned laboratory personnel. Typical procedures will include review of chain-of-custody forms, equipment calibration records and data completeness. Spot checks of raw data versus reported data may be performed to review math accuracy, significant numbers and reporting units. In addition, certified laboratory QA/QC checklists will be utilized per the selected laboratory's QA plan for individual test methods such as blanks, standards, and comparisons of internal lab test duplicates results. Problems with any of these items will be indicated in the report to the agency.

3.C.4. Internal Quality Control
Certified quality control samples may be run periodically in accordance with the selected laboratory's QA plan with sample batches obtained from appropriate commercial sources, or appropriate regulatory entities. Internal quality control will be addressed as required by the selected laboratory's QA plan and will typically include disclosure of the laboratory's use of blanks, blind standards, matrix spikes and matrix spike duplicates, preparation of reagents, and laboratory duplicate r replicate analysis.

3.D. Actions
3.D.1. Corrective Actions
Corrective actions will be implemented by laboratories if the analytical or sampling method does not achieve laboratory standards or Team Services objectives. Actions may entail re-sampling the waste stream and/or re-analyzing the fluid for a particular parameter, re-calibrating an analytical device, or other appropriate actions. Action levels will be taken in accordance with SW 846 or other approved EPA methods.

3.D.2. Reports to US EPA, Region 5 and MDEQ
Reports to US EPA and MDEQ will contain results, data and sampling descriptions regarding the accuracy, completeness and repeatability of the reported analytical results. The report will contain a table that specifies the type of sample (blank, waste, etc.), sampling date, sampling location, analytical method, method detection limit and analytical result. The results of analyses and all accompanying data, including chain-of-custody forms, will be reported to US EPA with the next quarterly operating report submitted to the agency after the receipt of the final sample

analysis report from the laboratory. This submittal to the agency will typically be within 60 days of the sampling event, unless prior arrangements have been made with the agency due to conditions beyond the control of the operator that prohibit such reporting.

ATTACHMENT H
SPECIAL CONDITIONS RELATED TO REMOTE MONITORING

If this well is monitored remotely, the following special conditions shall be applicable:

For the purpose of this permit, remote monitoring is defined as injection into the well when a trained operator is not present on site property and able to perceive shut-down alarms and able to physically respond to the well controls or the wellhead within 15 minutes of a compliance alarm condition.

1. Local operating system and remote monitoring system: If remote monitoring is to be used to operate the well, an operating system and programmable logic controller shall be on-site and shall have a back-up power supply and an automatic pager designed to alert designated on-call, off-site personnel in the event of a well alarm or shut-in. The off-site operator shall be able to remotely access the operating system to verify well conditions and alarm status.

2. Response to alarms and automatic shut-ins: Alarm conditions related to permit compliance conditions of the well under Part II (B) (5) shall be investigated on-site by a trained operator within one (1) hour of pager notification of the occurrence.

3. Loss of power to the computer: In the event of a power failure beyond the capability of the back-up power supply shuts down the computer, the well shall be automatically shut-in.

4. Loss of dial tone: If the automatic pager cannot get a dial tone for 15 minutes, the well shall automatically be shut-in.

5. Restart of the well after an automatic shut-in: Restart of the well after an automatic shut-in related to a permit condition alarm (including, but not limited to, injection pressure, annulus differential pressure, loss of dial tone for more than 15 minutes or computer power failure) shall require the physical presence of the operator on-site before the well can be restarted.

6. Restart of the well after non-permit condition related or scheduled shut-ins: If the well is shut-in for more than 48 hours for circumstances unrelated to permit conditions, restart of the well shall require the physical presence of the operator on-site.

7. Weekly operator inspections: If fluid injection occurs during the period of any week and the well is being monitored remotely, a trained operator shall physically visit the site to inspect the facility at a minimum frequency of not less than once per week. This inspection shall verify the correct operation of the remote monitoring system by review of items such as, but not limited to, a comparison of the values shown on mechanical gauges with those reported by the remote operating system.

8. When not in use by a trained well operator, offloading connections shall be locked at the valves leading to waste water tanks so that access is restricted to trained well operators.

Offloading of waste from offsite sources can only occur with a trained operator physically present on site. An offsite waste related bound log book will be maintained documenting that a trained well operator allowed offsite waste to be unloaded. At a minimum, offsite waste log book entries are to include operator name, date, time, generator identification, approximate volume, and approved waste source identification number from the effective permit. The bound offsite waste log book(s) will be considered part of the plant monitoring records regarding the injection well.